

CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Hesperia dacotae*

COMMON NAME: Dakota Skipper

LEAD REGION: 3

INFORMATION CURRENT AS OF: April 15, 2002

STATUS/ACTION (Check all that apply):

☒ New candidate

☐ Continuing candidate

☐ Non-petitioned

☐ Petitioned - Date petition received: _____

☐ 90-day positive - FR date: _____

☐ 12-month warranted but precluded - FR date: _____

_____ Is the petition requesting a reclassification of a listed species?

☐ Listing priority change

Former LP: _____

New LP: _____

Latest Date species first became a Candidate: _____

☐ Candidate removal: Former LP: _____ (Check only one reason)

☐ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

☐ F - Range is no longer a U.S. territory.

☐ M - Taxon mistakenly included in past notice of review.

☐ N - Taxon may not meet the Act's definition of "species."

☐ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Class Insecta; Order Lepidoptera; Family Hesperidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: 5 states: Illinois, Iowa, Minnesota, North Dakota, and South Dakota; also Canada (Manitoba and Saskatchewan)

CURRENT STATES/ COUNTIES (optional)/TERRITORIES/COUNTRIES OF OCCURRENCE:

Minnesota: Big Stone, Chippewa, Clay, Cottonwood, Kittson, Lac Qui Parle, Lincoln, Murray, Norman, Pipestone, Polk, Pope, Swift, Traverse, and Yellow Medicine Counties.

North Dakota: Burke, Eddy, McHenry, McKenzie, Oliver, Ransom, Richland, Rolette, Sargent, Stutsman, and Ward Counties.

South Dakota: Brown, Codington, Day, Deuel, Grant, Hamlin, Marshall, McPhearson, Moody, and Roberts Counties.

Canada (Manitoba and Saskatchewan)

LEAD REGION CONTACT (Name, phone number): Laura Ragan, (612)713-5157

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Twin Cites (MN) Field Office, Phil Delphey, (612)725-3548 ext. 206

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

The Dakota skipper inhabits high-quality tallgrass and mixed grass prairie. What was formerly hypothesized to be a contiguous or nearly contiguous population is now fragmented into more than 100 isolated populations or population complexes. Conversion of prairie and its degradation by overgrazing, exotic plant invasion, or other causes have reduced the range of Dakota skipper and continues to cause the extinction of local populations (Cochrane and Delphey 2002). Dakota skippers currently occur in fragments of native prairie in Minnesota, South Dakota, North Dakota, Manitoba, and Saskatchewan. Although specimens were collected near Chicago, Illinois in the 19th century, the species now occurs no further east than southwestern Minnesota. Its status in western North Dakota is tenuous, with the species disappearing from all but one site there in recent years. The species was last recorded in Illinois in 1888 and in Iowa in 1992 and has evidently been extirpated from both of these states (Cochrane and Delphey 2002).

Britten and Glasford's (2002) genetic analyses support the presumption that this species formerly had a relatively contiguous distribution. Relative strongholds for the species currently occur in northeastern South Dakota, in North Dakota's McHenry County, and at a few sites in southwestern Minnesota (Cochrane and Delphey 2002). Cochrane and Delphey (2002) list 150 sites at which Dakota skippers are extant or where the status of previously recorded populations are unknown (i.e., sites presumed to be extant). Of these, 102 occur within purported metapopulations (complexes of local populations connected by immigration), whereas 48 populations are completely isolated. Both populations and population complexes are generally isolated by the historic and ongoing fragmentation of native prairie and are subject to genetic drift that is likely to further reduce their genetic viability (Britten and Glasford 2002). According to species experts, significant unknown populations in Minnesota and North Dakota are unlikely to exist. A few additional populations may exist in the western portion of the species' currently known range in South Dakota where further surveys should be a high priority in our efforts to conserve this species. Significant unknown populations are also unlikely to occur in Manitoba or Saskatchewan. Approximately 99.9 percent of Manitoba's tallgrass prairie has been destroyed since the 19th century. In Saskatchewan, the lone known population was found in a one-hectare (2.5 acres) patch of mixed grass prairie by Ron Hooper of the Royal Saskatchewan Museum after searching "for forty years" (R. Hooper, Royal Saskatchewan Museum, pers. comm. 2002).

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing

specific, substantive information. **If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):**

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Within the historical range of Dakota skipper (Cochrane and Delphey 2002), the extent of native prairie habitat has declined sharply since approximately 1830. Smith (1992) states that in 1900 most of the prairie in Iowa had been converted to cropland and that the prairie ecosystem in Iowa "was close to extinction." "Two hundred and forty million acres of tallgrass prairie were converted to agricultural land in about seventy years" in Iowa, beginning about 1850 (Smith 1992). Similar settlement and destruction of Illinois prairie began about twenty years earlier (Smith 1992). Samson and Knopf (1994) reported that more than 99 percent of the original tallgrass prairie in Iowa, Minnesota, and North Dakota is destroyed (from 21 million hectares (52 million acres) down to 43,000 hectares (103,784 acres)). Eight-five percent of South Dakota's original 3 million hectares (7.4 million acres) of tallgrass prairie is gone; no data are available for losses of South Dakota mixes grass prairies. Mixed grass prairies in North Dakota have declined by approximately 72 percent (Samson and Knopf 1994). Samson and Knopf (1994) reported that approximately 81 percent of Saskatchewan's mixed grass prairie has been destroyed since Euro-American settlement and that less than 0.01 percent was protected. These figures do not account for the amount of remaining tallgrass and mixed grass prairie that is degraded (e.g., by overgrazing, invasion by smooth brome, plant succession, etc.) to the point that it is no longer suitable for Dakota skippers.

Remaining Dakota skipper habitat is threatened by grazing, conversion (e.g., plowing) of native prairie for row-crop agriculture, fire management, herbicide use, woody plant invasion (i.e., lack of appropriated management), road construction, gravel mining, exotic invasive species, and historically high water levels in South Dakota. Cochrane and Delphey (2002) interviewed Dakota skipper experts and reviewed all available reports to summarize the status of all known Dakota skipper sites. Based on this information, they found descriptions of site-specific threats for most of the sites. The following summary of specific threats is based on this information. Multiple categories of threats were ascribed to some sites, whereas there was no available information regarding threats for some sites.

Most Dakota skipper populations may have persisted on sites relatively unsuitable for row-crop agriculture. About 12 sites in North Dakota are threatened by conversion for row crop production, however, due to a combination of flat topography and a high water table (Cochrane and Delphey 2002).

Grazing is a much more pervasive threat than conversion for row-crop production. About 36 of the remaining U.S. sites (24 percent) are threatened by grazing, which frequently eliminates nectar sources for adult Dakota skippers and may eliminate or vastly reduce grass tissue necessary for survival of larvae. Grazing may also adversely affect Dakota skipper by trampling larvae, and, hypothetically, by altering larval microhabitats (R. Royer, Professor, Minot State University, Minot, North Dakota, in litt. 2000). Dana (1997) reported that in Minnesota, grazing by cattle reduces skipper numbers in direct proportion to grazing intensity.

Dakota skippers are reportedly threatened by fire at about 21 sites (Cochrane and Delphey 2002). Fire kills Dakota skipper larvae and may eliminate nectar sources for adults. Timing, frequency, and the proportion of the habitat patch burned are likely all important in determining the effect of prescribed or natural fires on Dakota skipper populations. Historically, Dakota skipper populations appear to have persisted in areas that were burned because fires were patchy relative to the extent of available habitat, allowing for recolonization from adjacent unburned areas (Swengel 1998). Now that Dakota skipper populations are highly fragmented, prescribed burning can cause local extinction without careful design and implementation (McCabe 1981, Dana 1991, Swengel 1998, Orwig and Schlicht 1999).

Cochrane and Delphey (2002) found that approximately 10 populations are threatened by herbicide use. Broadcast chemical control of exotic plants such as aerial spraying of leafy spurge, for example, eliminates native forbs that are skipper nectar sources (Royer and Marrone 1992). In repeated surveys, Royer and Marrone (1992) observed what "appears to be a correlation between disappearance of *Hesperia dacotae* and the advent of chemical spurge control methods in Ward, Barnes and Ransom Counties of North Dakota" including the Sheyenne National Grasslands area in the last ten to twenty years. Dana (1997) concluded that herbicide use for weed and brush control on private lands is the principal threat to skippers at the Hole-in-the-Mountain complex, Minnesota.

Approximately one-third of the populations are threatened by invasion of exotic plant species, a lack of appropriate disturbances, and/or tree plantings (Cochrane and Delphey 2002). Prairie habitats, especially tallgrass prairie, require periodic disturbance to prevent succession to habitat types unsuitable for Dakota skipper (e.g., shrubby or forested habitat types). Fire, grazing, or mowing or a combination of these are crucial for the persistence of Dakota skipper populations. As described above for grazing and fire, however, each of these also threaten Dakota skippers unless carefully managed. Haying is also a threat if conducted during certain larval stages or during the species' 2-3 week flight period. For various reasons, many owners and managers of sites occupied by Dakota skippers do not implement or allow for these disturbances to occur in a manner that ensures the persistence of Dakota skipper.

Finally, about 13 populations, most notably the Felton Prairie Preserve in Minnesota, are currently threatened by gravel mining (Cochrane and Delphey 2002).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Although its population biology could make the Dakota skipper sensitive to collection losses at some locations, the present level of scientific collection is incidental and does not threaten the existence of the species. The species is not collected for commercial purposes.

C. Disease or predation.

No known diseases or parasites are specific to the Dakota skipper and no threats to Dakota skipper populations due to disease have been reported. Predation by birds or insects is not considered a major feature of Dakota skipper population dynamics and does not threaten the

species.

D. The inadequacy of existing regulatory mechanisms.

The Dakota skipper receives no regulatory protection in North Dakota or South Dakota, which together comprise approximately half of the species' current range. The Dakota skipper is listed as threatened under Minnesota's endangered species statute. Under the Minnesota statute "a person may not take, import, transport, or sell any portion of an endangered species of wild animal or plant, or sell or possess with intent to sell an article made with any part of the skin, hide, or parts of Dakota skipper, except as permitted by the Minnesota Department of Natural Resources (Minnesota Statutes 2001, 84.0895, Protection of threatened and endangered species). This statute does not prohibit destruction of Dakota skipper habitat. In Manitoba it is unlawful to kill, injure, possess, disturb, or interfere with Dakota skipper; destroy, disturb, or interfere with its habitat; or damage, destroy, obstruct, or remove a natural resource on which Dakota skipper depends for its life and propagation. These prohibitions apply to all lands within Manitoba. Saskatchewan lacks the legal basis for protecting threatened or endangered invertebrates.

One-half of the U.S. populations of Dakota skipper (i.e., 68 of 136) occur on private land (i.e., excluding populations on land owned by The Nature Conservancy, see below). Seven of these populations are on private land with Federal conservation easements that preclude plowing and that delay haying to benefit Dakota skippers. These easements do not preclude the use of grazing practices that would adversely affect Dakota skippers, but overgrazing is not an imminent threat on these sites.

E. Other natural or manmade factors affecting its continued existence

Remaining Dakota skipper populations are generally small and isolated. Each Dakota skipper population is evidently now subject to genetic drift that will decrease genetic variability over time (Britten and Glasford 2002). Reduced genetic diversity could lower the capacity of populations to adapt to environmental changes. Even metapopulations (groups of local populations connected by migration) are now vulnerable to the effects of genetic drift and may be inbred (Britten and Glasford 2002). Moreover, of the 150 populations known to be extant or whose status is unknown, 48 are completely isolated from other populations and, therefore, especially vulnerable to extinction by stochastic events. For example, far northern sites in Minnesota are highly isolated. These sites lack any source of potential immigrants to recolonize them after events that result in local extinction. Dakota skippers must reproduce every year to persist. Therefore, events that prevent successful reproduction (e.g., haying or intensive grazing during the flight period) may result in local extinction. Due to the extensive historical destruction of native prairie, even populations that inhabit relatively large remnants of native grassland are isolated and are also vulnerable to extinction due to stochastic events, such as exotic plant invasion, severe weather (e.g. hail storms), accidental fire, or escape of planned fires.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? ____
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ____
- c. Is a proposal to list the species as threatened or endangered in preparation? ____
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

Table 1. Land ownership of Dakota skipper sites. Number of extant sites by state, with sites rated as secure by Dakota skipper experts in parentheses. The status of Canadian sites are unknown. Federal landowners include U.S. Fish and Wildlife Service in all three states and U.S. Forest Service in North Dakota. State lands in conservation status include state parks, game and waterfowl areas, and scientific and natural areas. State non-conservation lands include school sections, highway, and land department parcels.

Landowner	MB	SA	MN	ND	SD	Total
County			4			4
Federal			3	4	9 (7)	16 (7)
Sisseton-Wahpeton Sioux Tribe					10 (10)	10 (10)
TNC/Manitoba Naturalists Society	1		6 (1)	2	3 (2)	12 (3)
Private	10		28	19	21 (8)	78 (8)
State Conservation Agency	1		15		4	20
State Non-Conservation Agency	1			6		7
Unknown		1		1	1	3
Total	13	1	56 (1)	32 (0)	48 (27)	150 (28)

PRELISTING (Describe status of conservation agreements or other conservation activities):

U.S. Fish and Wildlife Service purchases easements to prevent the conversion of native prairie to crop production and provides cost-share funds to support rotational grazing and other practices that may benefit Dakota skippers. Grassland easements prevent grasslands from being plowed or destroyed and preclude haying before July 15, but do not place binding restrictions on grazing, pesticide use, or other practices that may degrade the status of Dakota skipper populations. Grassland easements have encompassed four Dakota skipper sites in the Scarlet Fawn Prairie-Knapp's Pasture complex in South Dakota, two sites in the Towner-Karlsruhe complex in North Dakota, and one site in the Sheyenne Grasslands area of North Dakota (C. Mowry, U.S. Fish and Wildlife Service, Tewaukon National Wildlife Refuge, North Dakota, pers. comm., 2001; K. Kreil, U.S. Fish and Wildlife Service, Bismarck, North Dakota, in litt., 2001). Easements also cover grasslands adjacent to two more Dakota skipper sites in the Towner-Karlsruhe complex, North Dakota.

The Nature Conservancy's (TNC) Minnesota and Dakotas offices initiated a Prairie Coteau Coordinated Conservation Planning Effort and plan in 1998 (Miller 1999, Skadsen 1999). Its strategy is to facilitate conservation actions by various landowners, including private, county, State, Tribal, and Federal, on high biodiversity prairie sites. Additional partners include conservation organizations, local conservation districts, and universities. TNC recently acquired a new reserve in the Sheyenne Grassland area, Brown Ranch, which harbors Dakota skippers.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

Britten, H.B. and J.W. Glasford. 2002. Genetic Population Structure of the Dakota Skipper (Lepidoptera: *Hesperia dacotae*): A North American native prairie obligate. Conservation Genetics (accepted).

Cochrane, J.F. and P. Delphey. 2002. Status Assessment and Conservation Guidelines. Unpublished report for U.S. Fish and Wildlife Service, Fort Snelling, Minnesota.

Dana, R.P. 1991. Conservation Management of the Prairie Skippers *Hesperia dacotae* and *Hesperia ottoe*: basic biology and threat of mortality during prescribed burning in spring. Minnesota Agricultural Experiment Station Bulletin 594-1991 (AD-SB-5511-S). University of Minnesota, St. Paul. 63pp.

Dana, R. 1997. Characterization of three Dakota skipper sites in Minnesota. Unpublished report, Minnesota Department of Natural Resources, Natural Heritage and Nongame Research Program, St. Paul, MN. 22 December 1997. 17+pp.

McCabe, T.L. 1981. The Dakota skipper, *Hesperia dacotae* (Skinner): range and biology, with special reference to North Dakota. Journal of the Lepidopterists' Society 35(3):179-193.

Miller, C. 1999. Prairie Coteau Coordinated Conservation Planning Effort. The Nature Conservancy of the Dakotas newsletter. Summer 1999.

Orwig, T. and D. Schlicht. 1999. The last of the Iowa skippers. American Butterflies 7(1):4-12.

Royer, R.A. and G.M. Marrone. 1992. Conservation status of the Dakota skipper (*Hesperia dacotae*) in North and South Dakota. Unpublished report, U.S. Fish and Wildlife Service, Denver, CO. 15 March 1992. 44+pp.

Sampson, F. and F. Knopf. 1994. Prairie Conservation in North America. Bioscience 44(6):418-421.

Schlicht, D.W. and T.T. Orwig. 1998. The status of Iowa's Lepidoptera. Journal of the Iowa Academy of Sciences 105(2):82-88.

Skadsen, D.R. 1999b. A report on Dakota skipper [*Hesperia dacotae* (Skinner 1911)] recovery meetings in South Dakota. Unpublished report, South Dakota Department of Game, Fish, and Parks. Pierre, SD. 15 August 1999. 7+pp.

Smith, D.D. 1992. Tallgrass prairie settlement: Prelude to the demise of the tallgrass ecosystem. Pp. 195-199 in D.D. Smith and C.A. Jacobs (eds.) Proceedings of the Twelfth North American Prairie Conference, University of Northern Iowa, Cedar Falls. 218 pp.

Swengel, A. 1998. Managing for Butterflies in Prairie: or, what do I do now that I want to manage for butterflies? North American Butterfly Association, Morristown, NJ. 7pp.

LISTING PRIORITY (place * after number)

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11*
		Subspecies/population	12

Rationale for listing priority number

Magnitude: Threats to this species are pervasive throughout the species' range and include a wide variety of factors that reduce the security of populations on both public and private lands. Moreover, the threats are exacerbated by the isolation of remaining populations. A few factors, however, moderate the magnitude of these threats. First, public and private conservation agencies are now undertaking conservation actions and habitat management activities that benefit the species. Second, land management by private landowners that appears to benefit the species (e.g., fall haying and light grazing), although uncommon, are ongoing in some areas. Third, although populations are isolated, we have documented approximately 65 isolated populations and population complexes (i.e. 17 populations complexes of one or more local populations plus 48 isolated populations) and a few significant unknown populations may exist in South Dakota. Finally, Dakota skipper experts consider several populations as secure in South Dakota and

Minnesota. These moderating factors seem to set the stage for recovery of the species, but are not sufficient to prevent listing at this time.

Immediacy: A wide variety of threats is gradually reducing the distribution of Dakota skipper, but most are not imminent. A few populations are imminently threatened, but most threats are likely to cause a gradual reduction in the already fragmented distribution of the species. Some threats that now seem non-imminent, however, may soon become imminent. For example, the rate of conversion of native prairie in McHenry County, North Dakota for row-crop production recently increased sharply. This seems to have been a short-term peak in habitat destruction that now seems to have subsided. Economic or other factors, however, could lead to similar rapid increases in the imminency of threats to Dakota skippers in some areas.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Marvin E. Moriarty April 2, 2002
 Acting Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams June 3, 2002
 Director, Fish and Wildlife Service Date

Do not concur: _____
 Director, Fish and Wildlife Service Date

Director's Remarks: _____

Date of annual review: _____
Conducted by: _____

Comments: _____

